WIBAUX—BEACH COMPARISON STUDY

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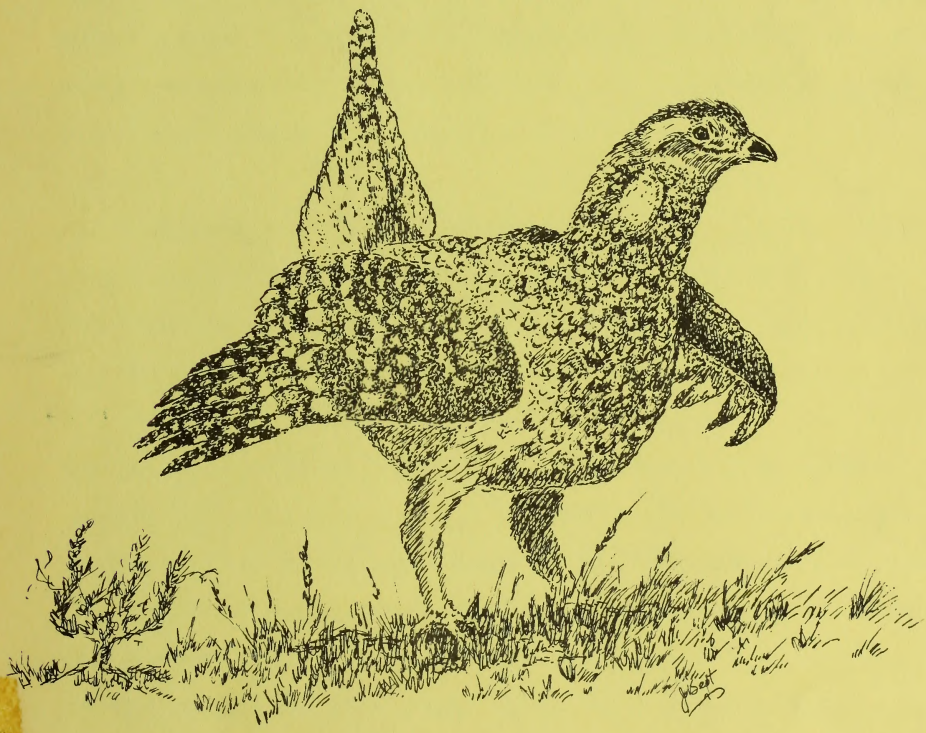
SIDNEY, GLENDIVE AND PLEVNA STUDY AREAS



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October 1980

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ABSTRACT

The Bureau of Land Management (BLM) recently conducted and completed a wildlife inventory on the Wibaux-Beach Known Recoverable Coal Resource Area (KRCRA), a 258 square-mile tract in Wibaux County, Montana and Golden Valley County, North Dakota. This information was necessary to make a responsible decision on possible coal leasing in this area. As part of the Wibaux-Beach project, BLM collected additional wildlife information on four nearby study sites to determine if the data was consistent and extrapolative for planning purposes on these other areas. If so, this would save considerable field time in the future collection of specific wildlife data.

Four study sites were initially selected for comparison purposes. All the areas lie within the Shortgrass Prairie Province as outlined by Bailey (1978). This report covers the Sidney study area (Richland County), Glendive study area (Dawson County), and Plevna study area (Fallon County).

Data was collected on the occurrence, relative abundance, and habitat relationships of wildlife species in Richland, Dawson and Fallon Counties. A total of 7100 trap nights were expended on the Sidney study area and 3,600 trap nights were expended on the Glendive and Plevna study areas for the spring, summer, and fall seasons. Incidental observations of wildlife were recorded while working these areas. Plus a route survey, 25 stops in length, was established and run for the spring, summer, and fall seasons on each study area.

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Approximately 400 observations, plus trap data, were obtained on each study areas. Data was collected on five species of amphibians and reptiles on the study areas.

Bird data included 59 species from the Sidney study area, 54 species from the Glendive study area, and 37 species from the Plevna study area. Also, data was collected on 23 species of mammals from the Sidney study area, and 11 species of mammals from the Glendive and Plevna study area. Additionally, known wildlife information from other sources pertinent to these area was identified for upcoming Unit Resource Analysis (URA) updates.

Most of the amphibians and reptiles were relatively common for these areas. Particularly noteworthy was the capture of a common garter snake. This was the only one captured during these studies, even though, they are supposedly fairly common. Most of the data on game species consisted of Montana Department of Fish, Wildlife, and Parks annual harvest and population statistics. Three sharptailed grouse leks were censused in Richland County; ten sharptailed grouse leks were censused in Fallon County. Western meadowlarks, mourning doves, horned larks, and ring-necked pheasants were the dominant birds on the areas. Deer mice were the dominant non-game mammal as obtained from trap data.

In addition, these studies were compared to the Wibaux-Beach study. Differences were noted for the creek bottom, sagebrush, and agriculture habitats. Overall, the data was comparable for planning purposes, though.

ACKNOWLEDGEMENTS

This study was a Bureau of Land Management (BLM) project, conducted by BLM personnel from the Miles City District Office in Miles City, Montana. We would like to extend our sincere appreciation to the many people who assisted in this project. Many landowners provided us with acccess to their land and provided information about the wildlife in the area. Montana Department of Fish, Wildlife and Parks personnel in Region 7, Miles City, were very helpful and provided much wildlife information. We would also like to thank the BLM personnel who assisted in this project, especially Gerry Gill, Dick Zander and Kathy Urick.

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INTRODUCTION

Background

The Bureau of Land Management (BLM) is mandated with the responsibility of managing the surface and/or subsurface resource values (i.e., range, wildlife, watershed, soil, minerals, etc.) on BLM-administered public lands. The BLM, in concert with other federal agencies (the U.S. Geological Survey and Office of Surface Mining) is also responsible for management of those federal mineral estates over private surface. As a federal land management agency, BLM has to make increasingly complex and oftentimes controversial decisions with regard to the best use or combination of uses of these public lands. In order to make the best possible decision regarding these public lands, much resource information and public input is needed.

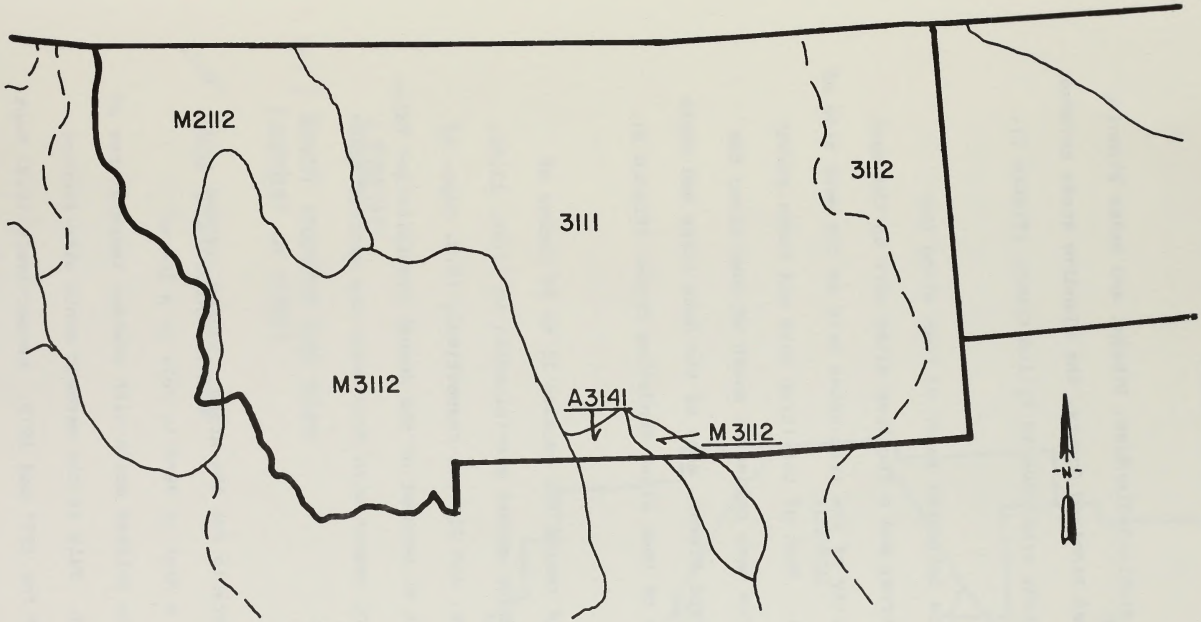
Within southeastern Montana, there has been an increased interest in possible leasing of federal minerals; however, there is little information available for these areas on the surface resource values. One such area is the Wibaux-Beach Known Recoverable Coal Resource Area (KRCRA). Because of possible coal leasing interest and the relative lack of wildlife information in this area, BLM initiated and recently completed an extensive wildlife inventory of this area (see Matthews, 1979, and Munson, 1979).

The Wibaux-Beach study area, a 258 square mile tract along the Montana and North Dakota borders lies within the boundaries of the Great Plains Shortgrass Prairie Province - "Wheatgrass - Needlegrass Section" as outlined by Bailey (1978). The area defined by Bailey encompasses 102,800 square miles in Montana and North Dakota, with the Wibaux-Beach study area lying in the

midwestern portion of the area (Figure 1). Since BLM needed wildlife information on public lands throughout the entire Shortgrass Prairie Province for planning purposes, BLM personnel in Miles City selected several additional study areas within the Shortgrass Prairie to collect wildlife information. This data will be compared to the Wibaux-Beach wildlife information to determine whether the data was comparable for planning purposes on a broad perspective within the Shortgrass Prairie Province. If so, this would save many hours in the field collecting specific wildlife information within this area.

Four study areas (Sidney, Glendive, Plevna, and Terry) were initially selected for comparison to the Wibaux-Beach study. The study areas were selected in three different BLM planning units but all lie within the Shortgrass Prairie Province. The first three study areas are in the "Wheatgrass - Needlegrass Section", while the Terry study area is in the "Grama - Needlegrass - Wheatgrass Section," some 20 to 30 miles distant. This report covers the Sidney, Glendive and Plevna study areas. The report for the Terry study area was completed earlier (Matthews, 1980).

The objectives of the study were to gather as much wildlife information as possible on the respective study sites for comparison to the Wibaux-Beach wildlife data. One week each season (fall, spring, and summer) was spent collecting data on the Glendive and Plevna study areas and two weeks each season were spent on the Sidney study area. In addition, known wildlife information for these areas from various sources was collected and consolidated into these reports.



LEGEND

GREAT PLAINS SHORT-GRASS PRAIRIE

3111- Grama, Needlegrass, Wheatgrass

3112- Needlegrass, Wheatgrass

WYOMING BASIN

A3141- Needlegrass, Wheatgrass, Sagebrush

COLUMBIA FOREST

M2112- Cedar-Hemlock-Douglas-Fir Forest

ROCKY MOUNTAIN FOREST

M3112- Douglas-Fir Forest

Figure 1 ECOREGIONS IN MONTANA

Description of Study Area

The study areas lie within the Richland-Glendive, Wibaux, and Baker Planning Units. The Sidney study included Richland County, the Glendive study covered Dawson County, and the Plevna study area covered Fallon County (Figure 2).

For Sidney, most of the data were collected south of town along the Yellowstone River. The route survey and a few trap sites were on the east side of the river, but the majority of the trap sites were on the west side of the river near Crane. (Figure 2). Most of the (trap data and route survey data) for the Glendive study area were collected south of town along the Yellowstone River. (Figure 2). For Plevna, most of the data (trap and route survey) were collected northwest of town along Sandstone Creek. (Figure 2).

The study areas are in a semiarid region and receive 10 to 20 inches of precipitation annually. The average annual precipitation is 12.41, 13.82, 13.68 inches for Sidney, Glendive, and Plevna, respectively (U.S. Dept. of Commerce, 1973). Normally, about 80 percent of the annual precipitation falls during the April-September growing season with June being the wettest month for the counties.

Temperature extremes vary considerably for the areas. Sidney extreme temperatures in 1978 ranged from a high of 98°F in July to a low of -37°F in December. January is the coldest month with average temperatures of 2.5°F and 1.2°F for 1977 and 1978. July is the warmest month with average temperatures of 70.6°F and 68.4°F for 1977 and 1978, respectively (U.S. Dept. of Commerce, 1977 and 1978). Glendive extreme temperatures in 1978 were

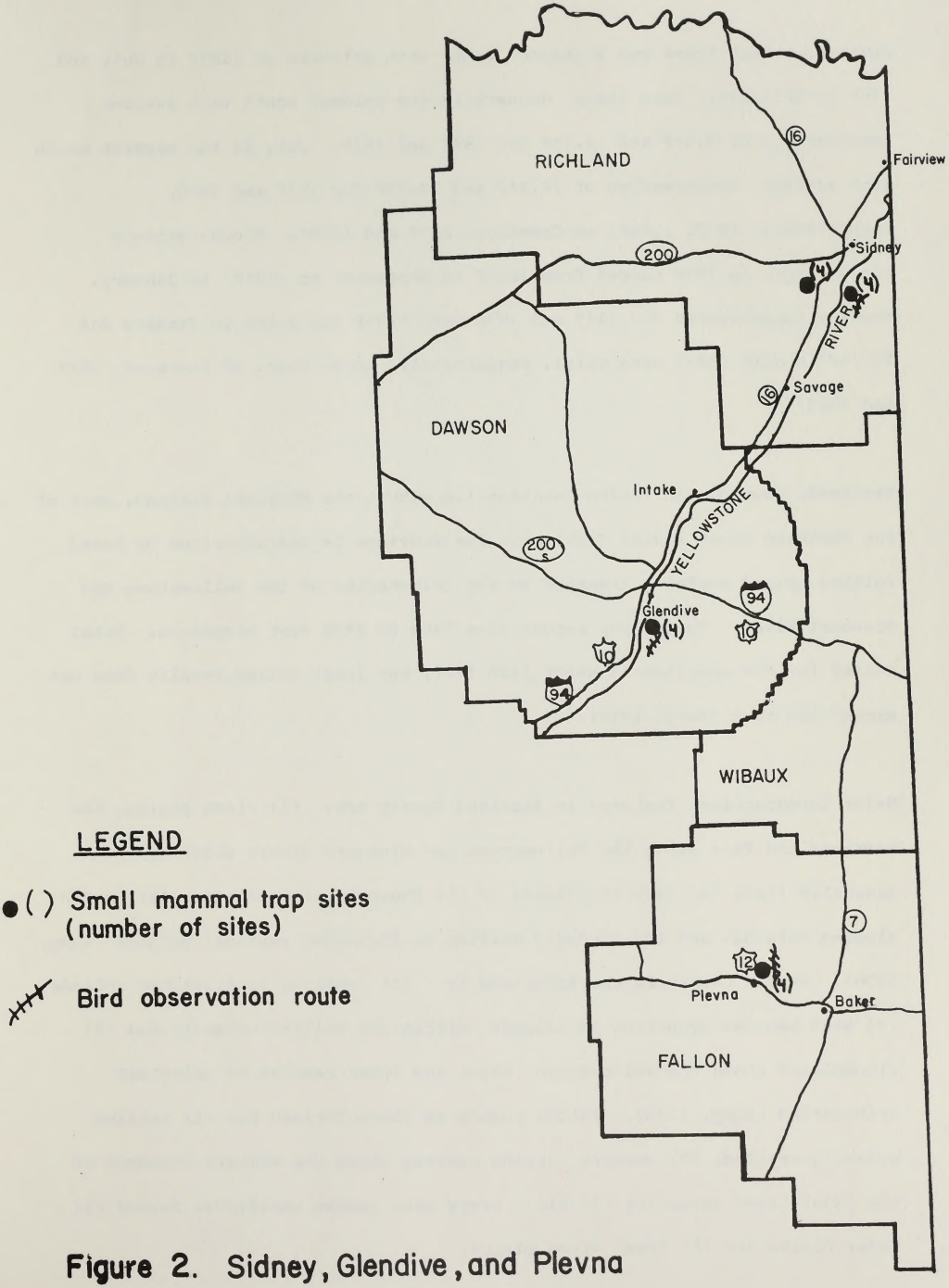
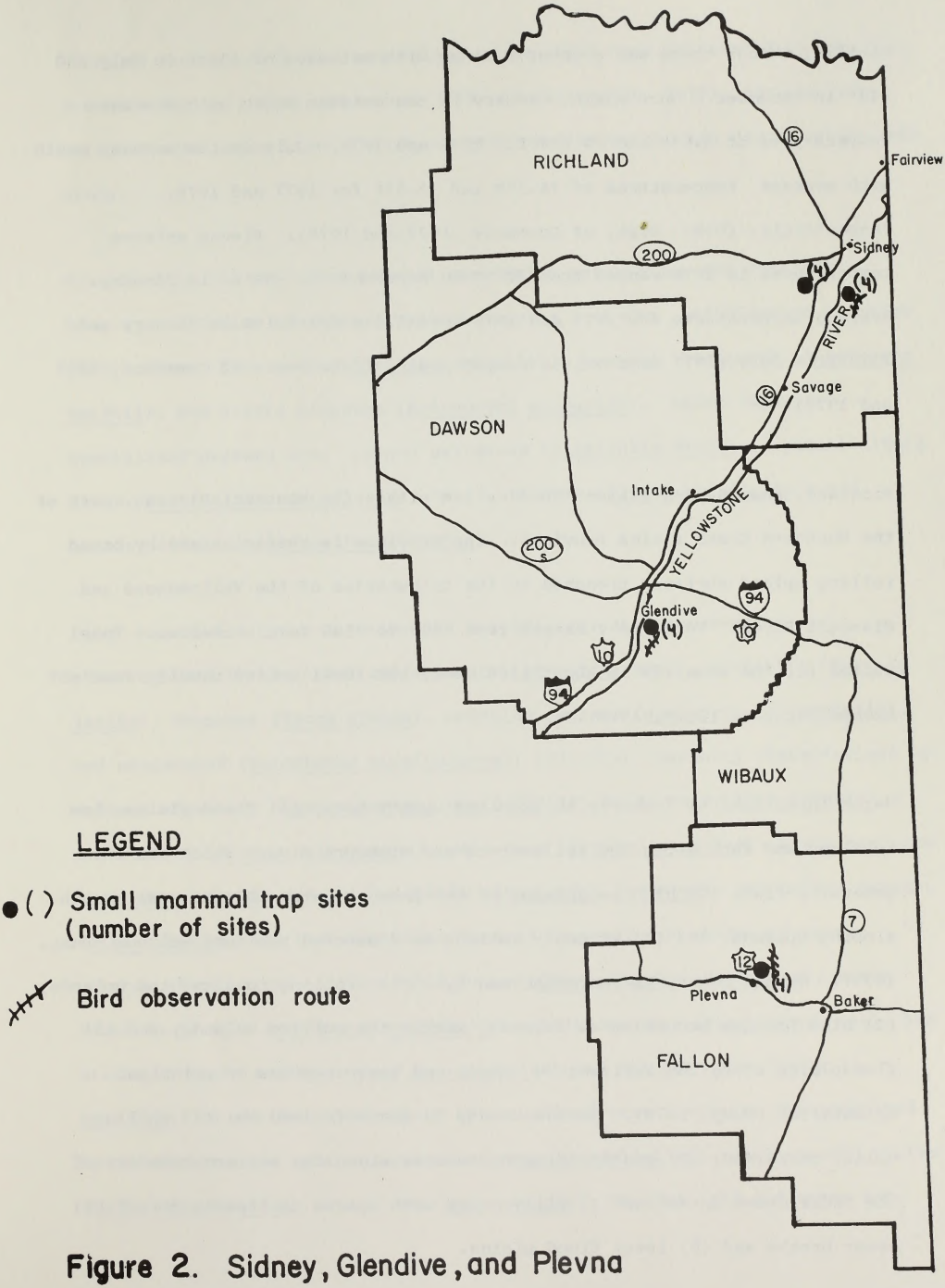


Figure 2. Sidney, Glendive, and Plevna Study Areas

similar, though there was a greater range with extremes of 105°F in July and -39° in December. Once again, January is the coldest month with average temperatures of 3.0°F and 4.6°F for 1977 and 1978. July is the warmest month with average temperatures of 76.3°F and 72.3°F for 1977 and 1978, respectively. (U.S. Dept. of Commerce, 1977 and 1978). Plevna extreme temperatures in 1978 ranged from 105°F in September to -33°F in January. Average temperatures for 1977 and 1978 were 5.0°F and 3.1°F in January and 73.2°F in July (1977 data only), respectively, (U.S. Dept. of Commerce, 1977 and 1978).

Richland, Dawson, and Fallon Counties lie within the Missouri Plateau, part of the Northern Great Plains Province. The Province is characterized by broad rolling upland surfaces trenched by the tributaries of the Yellowstone and Missouri River. Topography ranges from 1900 to 3500 feet elevation. Total relief for the counties is about 1300 feet, but local relief usually does not exceed 350 feet (Bump, 1978).

Major topographical features in Richland County are: (1) flood plains, low terraces and fans along the Yellowstone and Missouri Rivers which are generally flat; (2) high benchlands of the Sheep Mountain Divide; (3) smooth sloping uplands; and (4) strongly rolling to dissected residual uplands (Bump, 1978). Dawson County is characterized by: (1) rolling to dissected uplands; (2) high benches occurring as islands within the rolling uplands; and (3) floodplains along the Yellowstone River and lower reaches of principal tributaries (Bump, 1978). Fallon County is characterized by: (1) rolling upland grassland; (2) western dipping cuestas along the western boundary of the Cedar Creek anticline (3) hilly areas with sparse coniferous forest (4) cedar breaks and (5) level flood plains.



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Although several different vegetation communities were delineated in the Unit Resource Analysis (URA) (Roberts, 1978 and Livingston, 1979), for the most part, only the major vegetation types were considered and are described in this study.

Grassland is the prevalent natural vegetation association for Richland, Dawson, and Fallon Counties. Typical species include: buffalograss (Buchloe dactyloides), blue grama (Bouteloua gracilis), western wheatgrass (Agropyron smithii), and little bluestem (Andropogon scoparius). Other important specialized grasses are: inland saltgrass (Distichlis stricta), Nutall alkali grass (Puccinellia nuttalliana), Canada wildrye (Elymus canadensis), and common reedgrass (Phragmites communis).

Other vegetation types described in the URA are: (1) shrub-grassland characterized by sagebrush and sagewort (Artemisia spp.), winterfat (Eurotia lanata), soapweed (Yucca glauca), creeping juniper (Juniperus horizontalis), and greasewood (Sarcobatus vermiculatus); (2) shrub community characterized by western snowberry (Symphoricarpos occidentalis, Woods rose (Rosa woodsii), chokecherry (Prunus virginiana), wild plum (Prunus americana), black hawthorn (Crataegus douglasii), buffaloberry (Shepherdia argentea), and golden currant (Ribes aureum); (3) badlands characterized by weathered shale and sparse patches of sagebrush, rubber rabbitbrush (Chrysothamnus nauseosus), Rocky Mountain juniper (Juniperus scopulorum), ponderosa pine (Pinus ponderosa), and stands of green ash (Fraxinus pennsylvanica) and American elm (Ulmus americana) in the deep drainages; (4) broadleaf tree community characterized by an overstory of plains cottonwood (Populus deltoides), peach-leaved willow (Salix amygdaloides), box elder (Acer negundo), American elm and green ash,

and dominant understory species such as smooth brome (Bromus inermis), sweetclovers (Melitotus spp.), common milkweed (Asclepias syriaca), golden aster (Chrysopsis villosa), and False Solomon's seal (Smilacina stellata); (5) cultivated farmland such as croplands of small grains, corn, sugarbeets, haylands, and some interspersion of shelterbelts. (Roberts, 1978, and Livingston, 1979).

METHODS

Several different techniques were utilized in data collection for the wildlife species on the study area. All species observed during the study periods were recorded by numbers of individuals, habitat type, and location (township, range, and section number or stop number on route surveys).

Small mammals were trapped each season, except winter, in four vegetation types (eight vegetation types at Sidney) similar to the Wibaux-Beach trap sites. The traplines consisted of 25 stations with four traps per station in the same pattern as described by Matthews (1979). Traplines were set and checked daily for three successive nights in each vegetation type. All small mammals that were captured were identified and other data were recorded. Questionable and unusual specimens were sent to the Montana State University Zoological Museum for verification and storage. Incidental observations of all wildlife species or sign that was observed while on the study area were recorded. In addition, a route survey, 25 stops in length with stops spaced one-half mile apart, was established and run each season. The route survey was patterned after Robbins and Van Velzen's Breeding Bird Survey (1967), but the original technique was modified for this study. Instead of recording just birds, all wildlife species (snakes, deer, etc.) that were seen along the route were recorded at the respective stops. Also, species were recorded according to the predominant vegetation (e.g. grassland, cultivated croplands, etc.) that they were observed in.

In addition, pertinent data on game species were obtained from the Montana Department of Fish, wildlife, and Parks and other sources and identified

in this report. This was done to consolidate known wildlife information for this area for upcoming URA updates and to give some insight into the overall wildlife community there.

RESULTS

Because of the limited field time allocated, data on game species consisted mostly of a few incidental observations. Additional data on harvest, hunter, and some population statistics are available from the Montana Fish, Wildlife, and Parks Region 7 office in Miles City and annual big game survey and inventory reports.

Mule Deer, White-tailed Deer, and Antelope

As previously stated, most of the data that is available on mule deer, white-tailed deer, and antelope is from Montana's Fish, Wildlife, and Parks annual harvest data. Swenson (1978) did a wildlife study near Intake, Montana (Dawson County). He discussed distribution, movements, habitat utilization, and population characteristics of these game animals on his study area. Only 20 observations of white-tailed deer, 6 observations of mule deer, and 7 observations of antelope were obtained during these studies (Appendix Table 2 A, B, and C). These data are insufficient to determine anything in regards to the game species in this area. Particularly noteworthy was an observation of a female white-tailed deer with three fawns at Elk Island. Some does have two fawns/year under good environmental conditions, but triplets are quite rare.

Upland Game Birds

Observations of game birds obtained during this study are listed in Appendix Tables D, E, and F). For the most part, only incidental observations were obtained. Several mornings were allocated to check known sharp-tailed and sage grouse strutting grounds in Richland and Fallon Counties. Three sharp-tailed grouse strutting grounds were located and checked in Richland County. One large strutting ground (26 males and 10 females) was located at T.20 N., R.59 E., Sec. 32; the other two strutting grounds had six grouse each and were located at T.19 N., R.59 E., Sec. 2 and T.20 N., R.59 E., Sec. 11. Ten sharptailed grouse strutting grounds were checked in Fallon County (Table 1). Swenson (1978) located 14 sharp-tailed grouse leks near Intake and Munson (1979) found 16 sharptail leks in Wibaux County. Knapp (1976) described 78 percent of sharptail grouse distribution area in Region 7 as good to excellent habitat. In turn, Dawson, Richland, and Fallon Counties produced 27, 12, and 10 percent of the 1975 sharptailed grouse harvest for Region 7, respectively (Knapp, 1976).

While these counties have good populations of sharptails, such is not the case for the sage grouse in this area. Richland County and nearly all of Dawson County have been closed to hunting for the past several years because of the low sage grouse population there. Although hunting was allowed in Fallon County, the harvest only approximates 400 sage grouse annually. Only one sage grouse was observed during this study.

Ring-necked pheasants were observed 45 times during these studies. As expected, most of the observations were in agricultural lands, since this game

TABLE 1

KNOWN SHARP-TAILED GROUSE STRUTTING GROUNDS CHECKED IN FALLON COUNTY IN 1980.

Lek Number	Location	Number of Males	Females & Others
1	T.8N.,R.57E.,S.9, NE1/4	18-11a	0-2a
2	T.8N.,R.45E.,S.4, NE1/4	18	5
3	T.9N.,R.57E.,S.24, SW1/4	12	3
4	T.9N.,R.57E.,S.3, NE1/4	24	7
5	T.10N.,R.57E.,S.22, SW1/4	5	1
6	T.10N.,R.57E.,S.27, SW1/4	3-3a	1-1a
7	T.10N.,R.56E.,S.24, SW1/4	15	0
8	T.8N.,R.56E.,S.12, SW1/4	8b	-
9	T.8N.,R.57E.,S.6, NW1/4	14	7
10	T.6N.,R.54E.,S.14, SW1/4	5	0

a - Second set of numbers is a recheck at a later data.

b - Not a total count.

bird is closely associated with this habitat. No specific population data is available for the area, but Swenson (1978) gave crowing counts of 16.2 and 5.8 crows/stop for a river bottom and upland route, respectively. Richland and Dawson County were ranked number 1 and 2 counties for the 1974 pheasant harvest, respectively; however, these counties reversed their positions in 1975 (Knapp, 1976). Presently, two Game Management Areas in Richland County, Elk Island and Seven Sisters Island, are managed for pheasants. Fallon County contributes less than ten percent of the pheasant harvest annually.

Hungarian partridge (gray partridge) were observed only one time during this study. Dawson, Richland, and Fallon Counties provided 34, 20, and 14 percent of the 1975 hungarian partridge harvest and ranked number 1 2, and 3 for harvest in Region 7, respectively, (Knapp, 1976). However, specific population data for this area is unknown at this time.

Waterfowl and Raptors

Waterfowl and raptor observations obtained during the study are listed in Appendix Tables D, E and F. Very limited data (e.g. population and harvest) is available for raptors or waterfowl in this area. Known raptor nests are marked on the URA overlays. Fox Lake (Richland County) and the Yellowstone River are utilized by waterfowl in the area. Although Canada geese and some waterfowl utilize the river and reservoirs in the area for nesting purposes, this utilization is somewhat lower than areas farther west.

Furbearers and Predators

Information on furbearers and predators that was obtained during this study consisted mostly of incidental observations (Appendix Tables A and B). Fur harvest annual reports by hunting units are available for the area for past three years. Previous to that, it wast tabulated for the entire Region 7. Total pelts for Region 7 for the past three seasons were: 23,050 pelts for 1979-1980, 10,336 pelts for 1979-1978, and 13,706 pelts for 1978-1977 (Montana Fish, Wildlife, and Parks Fur Harvest Reports). The sharp increase in pelt numbers was probably because of the high pelt prices for the 1978-1979 season when coyote pelts were as high as $150/pelt.

Nongame

Herpetiles

Five species of herpetiles (amphibians and reptiles) were observed on the study areas (Appendix Table G). These were incidental observations. For the most part, these herpetiles were all fairly common in the area. Davis and Weeks (1963) and Stebbins (1963) list the common garter snake as occurring and fairly common in the area; however, this was the first time that one was actually collected during the course of these studies. Three species of reptiles (snapping turtle, spiny softshell turtle, and plains hognose snake) are "special interest or concern" species for the state of Montana in this area (Flath, 1979), but none were found during this study.

Birds

Fifty-nine species of birds were identified on the Sidney study area; 53 species of birds were identified on the Glendive study area; and 37 species of birds were identified on the Plevna study area. Data on their status, habitat utilization, and number of sightings are presented in Appendix Tables D, E, and F, respectively. Habitat utilization is a listing of those observations and habitats that the birds were observed in (in decreasing order). This listing is not meant to imply a preference of habitat selection by these species, but, rather habitat utilization as observed in these studies.

In addition, the Savage Breeding Bird Route (U.S. Fish and Wildlife Service) is located in the immediate vicinity, starting at Shadwell creek in Richland County and stopping at the northern boundary of the Wibaux-Beach study area (Wibaux County). Past results from this route are presented in Table 2. This route established in 1968, has been run eight times since. Most important is that it was run the last four years, which provides good data on breeding bird species, numbers, and changes during this period. Seventy-six species of birds have been identified on the Savage route. For the most part, bird species identified on the Glendive, Sidney, and Plevna study areas are quite comparable to those species identified on the Savage Breeding Bird Route. Only minor changes in some of the more uncommon or rare bird species occur. Likewise, when these data are compared to the Wibaux-Beach bird route data (Matthews, 1979), only minor differences in bird species were apparent, (e.g., blue jay, summer tanager, bobolink). This was expected because of the large

amount of time spent on the Wibaux-Beach area versus the other areas and subtle environmental differences between the areas.

Presently, three species of birds are listed as federally endangered species for this area: bald eagle, peregrine falcon, and whooping crane. Incidental observations of the bald eagle and whooping crane were obtained during the Wibaux-Beach study (Matthews, 1979); however, none were seen during these studies. In addition, Flath (1979) listed 23 additional bird species in these counties as "special interest or concern" species for the state of Montana (Appendix Table H). Most of the "special interest or concern" species are raptors, with the remainder either passerines or songbirds. Two "special interest or concern" species were observed on the Sidney study area, and four "special interest or concern" were identified on the Plevna and Glendive study areas, respectively. (Appendix Tables D, E, and F).

The western meadowlark, horned lark, mourning dove, and ring-necked pheasant were the more common species recorded on the study areas in their decreasing order of abundance. Sharp-tailed grouse, killdeer, red-winged blackbirds, Brewer's blackbirds, robins, brown thrashers, and chipping sparrows were also common species on these areas.

Mammals

Twenty-four species of mammals were observed on the Sidney study area and 11 species were observed on the Plevna and Glendive study areas. (Appendix Tables A, B, and C). Game species, furbearers, and predators were discussed previously. Most of the other observations of mammals were obtained by small

TABLE 2

SUMMARY OF BREEDING BIRD SURVEY RESULTS, SAVAGE ROUTE, 1968-1980

SPECIES	7/5/68	6/11/69	7/7/70	7/1/72	6/28/77	7/7/78	6/22/79	6/13/80
Eared Grebe	-	-	-	-	-	1/1	-	2/1
Pied-billed Grebe	-	-	-	-	-	-	-	2/1
Mallard	-	-	-	2/2	6/1	5/4	6/3	11/2
American Wigeon	-	-	10/1	-	9/1	-	1/1	2/1
Shovelor	-	-	-	-	-	-	3/1	-
Redhead	-	-	-	-	-	-	-	1/1
Ruddy Duck	-	-	-	-	-	-	-	2/1
Blue-winged Teal	-	1/1	-	2/2	13/1	2/2	-	-
Green-winged Teal	-	-	-	-	-	6/1	-	-
Golden Eagle	-	-	2/1	1/1	1/1	-	-	-
Red-tailed Hawk	-	-	-	-	-	-	-	1/1
Swainson's Hawk	-	-	-	-	-	-	1/1	1/1
Marsh Hawk	-	2/2	1/1	4/4	1/1	2/2	1/1	-
Americak Kestrel	2/2	1/1	2/2	1/1	4/4	1/1	7/5	3/2
Sharp-tailed Grouse	24/2	1/1	10/1	1/1	8/5	-	-	9/3
Ring-necked Pheasant	-	3/2	-	5/5	16/12	9/8	11/11	10/8
Gray Partridge	-	-	-	-	-	-	2/1	2/1
American Coot	-	-	-	-	-	-	1/1	-
Killdeer	1/1	3/3	4/3	8/7	14/7	8/4	15/8	24/13
Long-billed Curlew	-	-	-	-	1/1	-	-	-
Upland Plover	-	-	4/1	-	3/2	-	1/1	-
Common Snipe	-	-	-	1/1	-	-	-	-
Wilson's Phalarope	-	-	-	6/1	-	-	-	-
Rock Dove	-	-	-	-	-	-	-	2/1
Mourning Dove	53/19	41/22	22/8	18/16	75/30	61/26	111/32	69/33
Great Horned Owl	-	-	-	-	-	-	1/1	-
Black-billed Cuckoo	-	-	-	-	-	3/3	-	-
Short-eared Owl	-	1/1	2/2	-	-	-	1/1	-
Common Nighthawk	12/8	-	-	3/2	1/1	1/1	1/1	2/2
Common Flicker	3/2	1/1	2/1	1/1	12/8	4/4	-	2/2
Eastern Kingbird	25/17	4/4	15/11	14/10	15/11	13/10	12/7	19/12
Western Kingbird	8/5	1/1	2/2	4/2	4/2	3/3	5/3	-
Western Flycatcher	-	-	-	-	-	-	-	1/1
Say's Phoebe	2/2	-	-	1/1	3/3	-	2/1	-
Western Wood Pewee	-	-	-	-	1/1	-	-	-
Horned Lark	8/5	48/16	33/15	36/21	36/20	38/14	66/23	46/20

Numbers are: Total number of birds observed/number of stops at which observed.

	7/5/68	6/11/69	7/7/70	7/1/72	6/28/77	7/7/78	6/22/79	6/13/80
Rough-winged Swallow	-	-	-	-	3/2	9/5	-	2/1
Bank Swallow	-	-	1/1	-	-	-	-	-
Barn Swallow	-	4/2	6/4	3/3	3/3	11/7	16/8	17/9
Cliff Swallow	-	-	6/1	-	11/2	1/1	2/1	1/1
Black-billed Magpie	-	-	-	-	-	2/2	-	-
Common Crow	-	-	-	2/1	7/5	2/2	12/8	1/1
House Wren	-		-	-	-	3/3	-	5/4
Rock Wren	-	-	-	-	1/1	-	-	-
Catbird	-	1/1	-	3/3	-	-	2/1	-
Brown Thrasher	4/4	4/4	2/2	3/2	1/1	3/3	18/13	13/11
Robin	3/2	4/3	3/3	2/1	6/6	4/4	9/6	11/7
Mountain Bluebird	-	-	-	-	1/1	2/1	-	-
Loggerhead Shrike	4/2	4/4	11/7	2/2	7/6	4/4	3/3	2/2
Yellow Warbler	-	-	-	-	1/1	11/7	17/8	17/9
Yellowthroat	-	-	-	-	1/1	3/3	-	-
Yellow-breasted Chat	-	-	-	-	2/2	2/1	-	-
Starling	-	3/1	-	-	-	-	10/3	4/2
W. Meadowlark	153/41	339/48	127/39	75/39	173/49	297/50	363/50	305/50
Red-winged Blackbird	5/2	10/2	21/9	20/11	27/13	27/13	54/24	36/14
Orchard Oriole	-	-	-	-	-	-	-	1/1
Northern Oriole	-	-	-	-	-	1/1	-	-
Brewer's Blackbird	-	10/5	30/13	-	33/10	1/1	28/10	32/13
Common Grackle	-	-	-	-	2/1	1/1	-	-
Brown-headed Cowbird	13/3	6/3	9/4	17/7	10/8	56/21	37/11	33/20
Western Tanager	-	-	-	-	-	1/1	-	-
Black-headed Grosbeak	-	1/1	-	-	-	-	-	-
American Goldfinch	1/1	-	-	-	11/8	8/2	5/2	2/1
Rufous-sided Towhee	-	-	-	1/1	7/4	2/2	4/2	1/1
Lazuli Bunting	-	-	-	-	2/2	-	-	-
Savannah Sparrow	-	-	-	-	-	-	1/1	-
Grasshopper Sparrow	-	-	2/1	4/4	12/10	20/12	8/7	7/4
Lark Bunting	30/16	71/31	16/6	12/6	1/1	18/12	18/9	1/1
Vesper Sparrow	17/13	-	51/22	31/21	38/31	6/4	3/3	42/22
Lark Sparrow	16/9	21/12	27/19	-	5/3	1/1	5/3	1/1
Chipping Sparrow	-	-	1/1	-	-	2/1	-	-
Field Sparrow	-	-	-	-	17/12	1/1	-	-
Brewer's Sparrow	-	-	31/18	-	-	-	-	-
Song Sparrow	-	-	11/7	-	-	-	4/1	-
Chestnut-collared Longspur	-	-	-	-	-	2/2	-	-
Unidentified Hawk	-	-	-	-	-	1/1	-	-
TOTAL SPECIES/INDIVIDUALS	20/384	25/585	30/464	30/283	44/605	45/659	40/869	41/745

Numbers are: Total number of birds observed/number of stops at which observed

mammal trapping. Eight vegetation types were trapped on the Sidney study area versus only four vegetation types on the Glendive and Plevna study areas. Hence, a greater number of mammals were observed at Sidney.

Other than a few observations of cottontail rabbits which were not collected or identified to species, most of the remaining small mammals were trapped. Two nights were spent mist-netting bats in Sidney. Only one hoary bat was collected, although, several smaller bats were seen flying about. These unknown bats may have been different species but were not collected. Likewise, habitat utilization is a listing of the habitats that the mammals were observed or trapped in.

A total of 7100 trap nights were completed for eight vegetation types on the Sidney study area. Each vegetation type was trapped 300 trap nights for the spring, summer and fall season, except only 200 trap nights were completed for the spring season in the grassland coulee. Similarly, 3600 trap nights were completed for four vegetation types on the Glendive and Plevna study areas. There were 326 captures overall on the Sidney study area for a 4.59 capture/100 trap night efficiency (Table 3). On the Glendive study area, there were 254 captures overall for a 7.06 capture/100 trap night efficiency (Table 4). For the Plevna study area, 141 captures resulted in a 3.9 capture/100 trap night efficiency (Table 5). Fourteen species of small mammals, plus amphibians and birds, were captured on the Sidney study area (Table 3). On the Glendive study area, there were eight species of small mammals, plus birds, captured (Table 4); whereas, only six species of mammals, plus amphibians were captured on the Plevna study area (Table 5). Deer mice, redbacked voles, and masked shrews were the most abundant species

TABLE 3

COMPARISON OF SMALL MAMMAL DENSITIES IN EIGHT VEGETATION TYPES FROM THE SIDNEY STUDY AREA

SPECIES	Creek Bottom	Hardwood Draw	Grassland	Grassland Coulee	Agriculture	Sagebrush	Reservoir	Mesic Shrub	Total
Deer Mouse	27	43	3	11	14	49	6	46	199
Meadow Vole				5			10		15
Prairie Vole	2					3	1	6	12
Masked Shrew	9			2			11	3	25
Harvest Mouse			1		5		1		7
M. Jumping Mouse		5		5				2	12
Least Weasel							1		1
Red-Back Vole	22							8	30
Grasshopper Mouse					2				2
Pocket Gopher					1				1
13-lined Ground Squirrel					1				1
Pocket Mouse						1			1
L. Chipmunk		3							3
House Mouse					1				1
Birds[a]		5		2				8	15
Amphibians				1					1
TOTAL	60	56	4	26	24	53	30	73	326

a Eight different species of birds overall.

TABLE 4

COMPARISON OF SMALL MAMMAL DENSITIES IN FOUR VEGETATION TYPES FROM THE GLENDIVE STUDY AREA

Species	Creek Bottom	Grassland	Sagebrush	Grassland Coulee	Total
Deer Mouse	80	63	23	47	218
Prairie Vole	2	1		2	4
Meadow Vole	1				1
Harvest Mouse	1		5	18	24
Masked Shrew	1				1
Long-tailed Weasel	1				1
Wyoming Pocket Mouse		1			1
13-lined Ground Squirrel		1	2		3
Birds[a]	5	1			6
	91	67	30	67	254

a Four species of birds, overall.

TABLE 5

COMPARISON OF SMALL MAMMAL DENSITIES IN FOUR VEGETATION TYPES FROM THE PLEVNA STUDY AREA.

Species	Creek Bottom	Grassland Coulee	Grassland	Cultivated	Total
Deer Mouse	64	23	9	26	122
Long-tailed Weasel	1	1			2
Least Chipmunk	1				1
Western Harvest Mouse		2		6	8
Prairie Vole				2	2
13-lined Ground Squirrel			2		2
Birds	1	2[b]			3
Amphibians	1				1
	68	28	11	34	141

a 1000 trap nights for each vegetation type.

b 2 species.

on the Sidney study area; deer mice, harvest mice, and prairie voles were the most abundant small mammals on the Glendive study area; and deer mice and harvest mice were the abundant small mammals on the Plevna study area.

Diversity indices were tabulated for the vegetation types on the study areas (Table 6). On the Sidney study sites, the reservoir showed the most diversity overall followed by grassland coulee, creek bottom and agriculture in descending order. A possible explanation for this is water. All these vegetation types are mesic communities, including the agriculture which was irrigated cropland.

On the other hand, the grassland coulee showed the most diversity of the Glendive sites, followed by sagebrush, creek bottom, and grassland. Normally, one would expect greater diversity in a creek bottom habitat. A factor may be because this area was burned by fire this spring and poor trap results were obtained for the spring season. Considering this, water could still be the correlation between diversity and these vegetation types.

Diversity indices for the Plevna study sites did not follow this pattern. Instead, agriculture, grassland coulee, and finally creek bottom was the ranking of the habitats in descending order. The low number of species and low number of individuals trapped at these study site may not represent a good sample of these habitats for this area.

TABLE 6

DIVERSITY INDICES FOR THE SIDNEY, GLENDIVE AND PLEVNA STUDY AREAS 1, 2.

Vegetation Type	Number of Species	Number of Individuals	Simpson's Index	Shannon-Weiner Index	Evenness
Creek Bottom$_a$	4	60	2.85	1.61	1.16
Creek Bottom$_b$	6	86	1.16	0.56	0.31
Creek Bottom$_c$	3	66	1.06	0.23	0.21
Grassland$_a$	2	4	2.00	0.81	1.17
Grassland$_b$	4	66	1.10	0.33	0.23
Grassland$_c$	2	11	1.49	0.68	0.98
Sagebrush$_a$	3	53	1.17	0.56	0.51
Sagebrush$_b$	3	30	1.65	1.02	0.93
Grassland Coulee$_a$	4	23	3.33	1.80	1.30
Grassland Coulee$_b$	3	67	1.79	1.03	0.94
Grassland Coulee$_c$	3	26	1.28	0.62	0.56
Hardwood Draw$_a$	3	51	1.39	0.78	0.71
Agriculture$_a$	6	24	2.71	1.79	1.00
Agriculture$_c$	3	34	1.50	0.98	0.89
Reservoir$_a$	6	30	3.78	2.04	1.14
Mesic Shrub$_a$	5	65	1.92	1.39	0.87

1. Based on small mammal trap data only.
2. The higher the numerical value for the indices, the greater the diversity and evenness.

a Sidney Study Area
b Glendive Study Area
c Plevna Study Area

DISCUSSION

Overall, animal species occurrence and their relative abundance were favorably comparable between the Wibaux-Beach study area and the four sample areas. The information derived from each area is useful for those purposes for which these studies were designed, i.e., planning purposes by BLM on a broad perspective within the Shortgrass Prairie Ecosystem. By the same token, data from the Intake study (Swenson, 1978) and the Circle West study area (Thompson, 1978) are also quite comparable, but one would expect the various groups of animals (amphibians, reptiles, birds, and mammals) to be similar in composition and relative abundance as long as the area (short-grass prairie) and habitats are comparable.

There are some noteworthy differences between the areas though. These variations in the animal community composition were expected as there are also subtle habitat, climatic, and geographic variations between the study areas. Still, these data are much more refined than previous information. By keeping this in mind and making adjustments for the differences between the areas, animal community structure and composition can be worked out.

Noted differences for the creek bottom habitat were mostly geographic-related. Creek bottoms for Sidney and Glendive study areas were more developed with a distinct overstory, understory, and ground floor than the Plevna or Terry study areas. More of the characteristic riparian-habitat birds (e.g. mourning doves, flicker, robin) were found at Glendive, Sidney, and Wibaux than the other areas. This was probably related to the sites and their proximity to the Yellowstone River and its tributaries. Sidney and Glendive study areas are adjacent to the Yellowstone; whereas, Plevna and Terry study areas were

farther removed. Hence, there was a corresponding decline in riparian species for the latter areas. The Wibaux data appears to show a well-developed riparian animal community structure, but much more field time was spent at Wibaux. In turn, even the more rare, secretive species were recorded.

Similar differences were noted for the sagebrush habitat, but, the areas were reversed in position. Terry and Plevna study areas show more vesper sparrows and sage grouse (based on harvest data) than the other areas. Likewise, this was believed to be because of the lack of the well-developed sagebrush for the latter areas.

Agriculture showed much the same, in that, those areas with well established farming practices (Sidney, Glendive, and Wibaux) had more ring-necked pheasants, white-tailed deer and house mouse observations.

No really apparent differences in species composition were noted for the grassland or grassland coulees for the areas. Neither habitat has the complex vegetation community structure needed to support a divergent animal community. Hence, their influence, as exhibited in the data, is not as marked as the habitats with more complex structures.

Likewise, reservoirs, badland bluffs, etc. influence the area as a whole. Each of these habitats contribute some species to the area but they are small and not really that distinct from one another (e.g., waterfowl species recorded at Coal Creek Reservoir at Terry were similar in species and abundance to waterfowl data from Odland's Reservoir obtained from the Wibaux-Beach study).

Information derived extrapolation, does not satisfactorily answer coal unsuitability criterion, but it was not meant to. Rather, it was needed to form a background basis for planning future inventories and projects and, for these purposes, it is satisfactory.

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APPENDIX TABLE A

MAMMALS IDENTIFIED ON THE SIDNEY STUDY AREA

Species	Sightings By Habitat [1]	Total Sightings
Masked Shrew *Sorex cinerus*	11(11) Res_2 9(9)CB_2 3(3)MS_2 2(2)$GrCou_2$	25(25)
Hoary Bat *Lasiurus cinereus*	1(1)Cr_3	1(1)
Unknown Bats	1(4)CB	1(4)
Cottontail Rabbit *Sylvilagus* spp.	2(2)HD 1(1)CB 1(1)MS	4(4)
Thirteen-lined Ground Squirrel *Citellus tridecemlineatus*	1(1)UG 1(1)$Cult_2$	2(2)
Least Chipmunk *Eutamias minimus*	1(1)HD 3(3)HD_2	4(4)
Northern Pocket Gopher *Thomomys talpoides*	1(1)$Cult_2$	1(1)
Wyoming Pocket Mouse *Perognathus fasciatus*	1(1)XS_2	1(1)
Beaver *Castor canadensis*	1(1)YR	1(1)
Western Harvest Mouse *Reithrodontomys megalotis*	5(5)$Cult_2$ 1(1)Res_2 1(1)Gr_2	7(7)
Northern Grasshopper Mouse *Onychomys leucogaster*	2(2)$Cult_2$	1(1)
Deer Mouse *Peromyscus maniculatus*	49(49)XS_2 46(46)MS_2 43(43)HD_2 27(27)CB_2 14(14)$Cult_2$ 11(11)$GrCov_2$ 6(6)Res_2 3(3)Gr_2	199(199)

Boreal Redback Vole *Clethrionomys gapperi*	22(22)CB_2 8(8)MS_2	30(30)
Meadow Vole *Microtus pennsylvanicus*	10(10) Res_2 5(5)$GrCou_2$	15(15)
Prairie Vole *Microtus ochrogaster*	6(6)MS_2 3(3)XS_2 2(2)CB_2 1(1)Res_2	12(12)
House Mouse *Mus musculus*	1(1)$Cult_2$	1(1)
Meadow Jumping Mouse$_X$ *Zapus hudsonius*	5(5)HD_2 5(5)$GrCou_2$ 2(2)MS_2	12(12)
Porcupine *Erethizon dorsatum*	1(1)Cult 1(1)HD	2(2)
Coyote *Canis latrans*	1(1)Gr	1(1)
Red Fox *Vulpes fulva*	1(2)HD	1(2)
Raccoon *Procyon lotor*	1(1)CB	1(1)
Least Weasel *Mustela rixosa*	1(1)Res_2	1(1)
Badger *Taxidea taxus*	1(1)Gr	1(1)
White-tailed Deer *Odocoileus virginianus*	8(12)CB 2(2)HD 1(6)Cult	11(26)

Legend:

X - Montana "special interest or concern" species

1 - Numbers are total number of sightings (total number of individuals sighted).

2 - Sightings were obtained from small mammal trap data.

3 - Captured by mist-netting.

Res - Reservoir	YR - Yellowstone River
CB - Creek Bottom	HD - Hardwood Draw
Gr - Grassland	Gr Cou - Grassland Coulee
MS - Mesic Shrub	Cult - Cultivated Cropland
XS - Sagebrush	Cr - Creek

APPENDIX TABLE B

MAMMALS IDENTIFIED ON THE GLENDIVE STUDY AREA

Species	Sightings by Habitat	Total Sightings
Masked Shrew *Sorex cinerus*	1(1)CB_a	1(1)
Cottontail Rabbit *Sylvilagus* spp.	2(2)XS 1(1)HD	3(3)
Thirteen-lined Ground Squirrel *Citellus tridecemlineatus*	2(2)XS_a 1(1)XS 1(1)Gr_a	3(3)
Wyoming Pocket Mouse *Perognathus fasciatus*	1(1)Gr_a	1(1)
Western Harvest Mouse *Reithrodomtomys megalotis*	18(18)$GrCou_a$ 5(5)XS_a 1(1)CB_a	24(24)
Deer Mouse* *Peromyscus maniculatus*	80(80)CB_a 67(67)$GrCou_a$ 63(63)Gr_a 23(23)XS_a	223(223)
Meadow Vole *Microtus pennsylvanicus*	1(1)CB_a	1(1)
Prairie Vole *Microtus ochrogaster*	2(2)$GrCou_a$ 1(1)CB_a 1(1)Gr	4(4)
Coyote *Canis latrans*	1(1)BB	1(1)
Long-tailed Weasel *Mustela frenata*	1(1)CB_a	1(1)
White-tailed Deer *Odocoileus virginianus*	3(10)HD	3(10)

Legend:

X - Montana "special interest or concern" species

1 - Numbers are total number of sightings (total number of individuals sighted).

2 - Sightings were obtained from small mammal trap data.

Res - Reservoir
CB - Creek Bottom
Gr - Grassland
MS - Mesic Shrub
XS - Sagebrush
YR - Yellowstone River
HD - Hardwood Draw
Gr Cou - Grassland Coulee
Cult - Cultivated Cropland
Cr - Creek

a - Small mammal trap data

* - Some of these individuals were extremely large and showed some charteristics of white-footed mice (Peromyscus leucopus), but we were unable to save these specimens as no form of refrigeration was available.

APPENDIX TABLE C

MAMMALS IDENTIFIED ON THE PLEVNA STUDY AREA

Species	Sightings by Habitat[1]	Total Sightings
White-tailed Jackrabbit *Lepus townsendii*	2(2)Gr	2(2)
Thirteen-lined Ground Squirrel *Spermophelis tridecemlineatus*	1(1)Gr 2(2)Gr_a	3(3)
Least Chipmunk *Eutamias minimus*	1(1)CB_a	1(1)
Western Harvest Mouse *Reithrodontomys megalotis*	6(6)$Cult_a$ 2(2)$GrCou_a$	8(8)
Deer Mouse *Peromyscus maniculatus*	64(64)CB_a 26(26)$Cult_a$ 23(23)$GrCou_a$ 9(9)Gr_a	122(122)
Prairie Vole *Microtus ochrogaster*	2(2)$Cult_a$	8(8)
Long-tailed Weasel *Mustela ochrogaster*	1(1)CB_a	2(2)
Striped Skunk *Mephitis mephitis*	2(2)Gr 1(1)Cult	3(3)
White-tailed Deer *Odocoileus virginianus*	4(16)Gr 1(19)Cult 1(1)HD	6(36)
Mule deer *Odocoileus hemionus*	5(40)Cult 1(8)Gr	6(48)
Antelope *Antilocapra americana*	2(10)XS 2(18)Gr 3(13)Cult	7(41)

Legend:
1 - Numbers are total number of sightings (total number of individuals sighted).

Gr - Grassland
Cult - Cultivated Cropland
HD - Hardwood Draw
XS - Sagebrush
GrCou - Grassland Coulee
CB - Creek Bottom
Homesite - Homesite

APPENDIX TABLE D

BIRDS IDENTIFIED ON THE SIDNEY STUDY AREA

Species	Status[1]	Sightings by Habitat[2]	Total Sightings
Great Blue Heron *Ardea herodias*	B	1(2)Cr 1(2)Gr 1(2)Cult	3(6)
Canada Goose *Branta canadensis*	B	5(16)YR	5(16)
Mallard *Anas platyrhynchos*	B	1(5)Res 1(5)Cr 1(4)Gr	3(14)
Blue-winged Teal *Anas discors*	b	1(2)Res	1(2)
American Wigeon *Anas americana*	b	1(2)YR	1(2)
Red-tailed Hawk *Buteo jamaicensis*	1	1(1)HD	1(1)
Ferruginous Hawk[x] *Buteo regalis*	b	2(2)Gr	2(2)
Marsh Hawk *Circus cyaneus*	b	2(2)Cult 1(1)Gr	3(3)
Prairie Falcon[x] *Falco mexicanus*	-	2(2)Cult	2(2)
American Kestrel *Falco sparverius*	b	4(5)Gr 3(4)Cult 1(2)HD	8(11)
Sharp-tailed Grouse *pedioecetes phasianellus*	B	2(5)Cult	2(5)
Sage Grouse *Centrocercus urophasianus*	B	1(1)XS	1(1)
Ring-necked Pheasant *Phasianus colchicus*	B	14(53)Cult 7(10)CB 3(18)Cr	24(81)
Gray Partridge *Perdix perdix*	b	1(4)Cult	1(4)
Sandhill Crane *Grus canadensis*	t	1(3)Gr	1(3)

Sora *Porzana carolina*	b	1(1) Gr Cou	1(1)
Killdeer *Charadrius vociferus*	b	9(22)Cult 6(9)Gr 1(1)Gr	16(32)
Common Snipe *Capella gallinago*	b	1(1)Res	
Ring-billed Gull *Larus delawarensis*	-	1(1)Cult	1(1)
Rock Dove *Columba livia*	b	4(12)Gr 1(2)Homesite	5(14)
Mourning Dove *Zenaidura macroura*	b	8(58)Cult 13(56)CB 3(14)HD	24(128)
Great Horned Owl *Bubo virginianus*	6	1(1)HD	1(1)
Common Nighthawk *Chordeiles minor*	B	2(2)Cult 1(1) Gr	3(3)
Belted Kingfisher *Megaceryle alcyon*	b	2(2) Cr 1(1) HD	3(3)
Horned Lark *Eremophila alpestiris*	B	7(21) Cult 4(4) GY	11(25)
Common Flicker *Colaptes auratus*	b	2(4)Homesite 1(3)HD 1(1)Gr	4(8)
Eastern Kingbird *Tyrannus tyrannus*	b	1(4)HD 1(2)Gr	2(6)
Western Kingbird *Tyrannus verticalis*	B	1(2)Cult	1(2)
Says Phoebe *Sayornis saya*	b	1(1)Homesite 1(1)Gr	2(2)
Barn Swallow *Hirundo Rustica*	b	5(11)Gr 3(3)Cult 1(2)Cr	9(16)
Cliff Swallow *Petrochelidon pyrrhonota*	B	1(1)Cr	1(1)
Blue Jay *Cyanocitta cristata*	-	1(5)CB	1(5)

Yellow Warbler *Dendroica coronata*	b	4(11)HD	4(11)
Yellow-breasted Chat *Icteria virens*	b	1(1)HD 2(2) MS	3(3)
House Sparrow *Passer domesticus*	b	5(52)Homesite 1(6)HD	6(58)
Western Meadowlark *Sturnella neglecta*	b	21(115)Gr 12(34)Cult 9(58)Gr-Cult 3(12)XS 1(4)HD	36(223)
Red-winged Blackbird *Agelaius phoenicus*	B	7(171)Cult 7(127)Gr 3(16)HD	17(314)
Brewers Blackbird *Euphagus cyanocephalus*	b	7(376)Gr 5(696)Cult	12(1072)
Northern Oriole *Icterus galbula*	b	1(1)HD	1(1)
Common Grackle *Quiscalus quiscalus*	b	1(2)Homesite 1(1)Gr	2(3)
Brown-headed Cowbird *Molothrus ater*	B	1(2)Gr	1(2)
Black-billed Magpie *Pica pica*	B	2(8)HD 1(15)Gr 1(2)Cult 1(1)Homesite	5(26)
Common Crow *Corvus brachyrhychos*	b	4(7)Cult 2(5)Gr	6(12)
House Wren *Troglodytes aedon*	b	8(11)HD 2(3)Gr	10(14)
Gray Catbird *Dumetella carolinensis*	b	2(2) MS	2(2)
Brown Thrasher *Toxostoma rufum*	b	2(2)HD 1(1)Gr	3(3)
Robin *Turdus migratorius*	b	10(50)HD 3(7)Cult 3(3)Gr 2(5)Homesite	18(65)

Cedar Waxwing Bombycilla cedrorum	b	1(6)	1(6)
Starling Sturnus vulgaris	b	2(7)Gr 2(4)Homesite 1(2)Cult	5(13)
Loggerhead Shrike Lanius ludovicianus	b	4(5) Gr 1(4)XS	5(9)
Evening Grosbeak Hesperiphona vespertina	-	1(1)HD	1(1)
American Goldfinch Carduelis flammea	b	1(1)HD	1(1)
Rufous-sided Towhee Pipilo erythrophthalmus	b	2(3)HD 3(3)MS	5(6)
Savannah Sparrow Passerculus sandwichensis	b	2(20)Cult 1(1) Gr Cou	3(21)
Vesper Sparrow Pooecetes gramineus	b	4(9)Gr 2(20)Cult	6(29)
Lark Sparrow Chondestes grammacus	B	2(4)Gr 1(3)Cult	3(7)
Dark-eyed Junco Junco nyemalis	t	1(1)Gr 1(1) HD	2(2)
Tree Sparrow Iridoprocne bicolor	t	1(1)HD	1(1)
Chipping Sparrow Spizellas passerina	b	1(1) Gr	1(1)

Legend:

Status:

x Montana "special interest or concern" species
- no evidence of occurrence
1 probably valid records
t occurs, no evidence of breeding
b circumstantial evidence of breeding
B hard evidence of breeding

1 - Based on Montana Bird Distribution.

2 - Number are total number of sightings (total number of individuals sighted).

Res - Reservoir
CB - Creek Bottom
Gr - Grassland
MS - Mesic Shrub
XS - Sagebrush
YR - Yellowstone River
HD - Hardwood Draw
GrCou - Grassland Coulee
Cult - Cultivated Cropland
Cr - Creek
Homesite - Homesite

APPENDIX TABLE E

BIRDS IDENTIFIED ON THE GLENDIVE STUDY AREA

Species	Status[1]	Sighting by Habitat[2]	Total Sightings
Turkey Vulture *Cathartes aura*	b	1(1)HD	1(1)
Red-tailed Hawk *Buteo jamaicensis*	1	1(1)Gr	1(1)
Marsh Hawk *Circus cyaneus*	b	1(1)Gr	1(1)
Prairie Falcon[x] *Falco mexicanus*	-	2(2)Gr 1(1)Cult	3(3)
American Kestrel *Falco sparverius*	b	2(2)Cult 2(2)Gr 2(2)XS 1(1)HD 2(2)CB	9(9)
Sharp-tailed Grouse *Pedioecetes phasianellus*	B	1(2)Gr	1(2)
Ring-necked Pheasant *Phasianus colchicus*	B	6(19)HD 2(3)CB 2(2)Cult 1(3)Gr 1(1)XS	12(30)
Killdeer *Charadrius vociferus*	b	2(4)XS 2(2)CB 1(4)Homesite 1(1)Cult 1(1)Gr	7(12)
Upland Sandpiper[x] *Bartramia longicauda*	b	1(1)Gr	1(1)
Mourning Dove *Zenaidura macroura*	b	7(24)HD 6(45)Gr 4(10)XS 2(5)Cult 2(3)BB 1(8)Homesite 1(4)CB	23(99)
Belted Kingfisher *Megaceryle alcyon*	b	1(1)Cr	1(1)

Common Flicker *Colaptes auratus*	b	4(4)CB 3(5)HD 1(1)BB	8(10)
Red-headed Woodpecker *Melanerpes erythrocephalus*	b	1(1)HD	1(1)
Eastern Kingbird *Tyrannus tyrannus*	b	3(7)Gr 1(2)HD 1(2)CB 1(2)Homesite	6(13)
Western Kingbird *Tyrannus verticalis*	B	1(2)HD 1(1)Gr	2(3)
Least Flycatcher *Empidonax minimus*	b	1(2)HD	1(2)
Western Wood Pewee *Contopus sordidulus*	-	1(1)HD	1(1)
Horned Lark *Ermophila alpestris*	B	5(9)Cult 4(29)Gr 1(4)XS	10(42)
Rough-winged Swallow *Stelgidopteryx ruficollis*	-	1(2)GrCou	1(2)
Barn Swallow *Hirundo rustica*	b	4(9)Gr 1(4)Homesite 1(4)XS 1(2)HD 1(2)BB	8(21)
Bank Swallow *Riparia riparia*	b	1(2)MS	1(2)
Violet-green Swallow *Tachycineta thalassina*	-	1(3)GrCou	1(3)
Blue Jay *Cyanocita cristata*	-	1(5)HD 1(1)Cult	2(6)
Pinyon Jay *Gymnorhinus cyanocephalus*	-	1(30)Homesite 1(1)HD	2(31)
Yellow Warbler *Dendroica coronata*	b	6(17)HD 1(1)CB 1(1)MS	8(19)
Yellow-breasted Chat *Icteria virens*	b	4(7)HD 2(2)CB	6(9)
American Redstart *Setophaga Ruticilla*	b	2(3)HD	2(3)

House Sparrow *Passer domesticus*	b	2(16)Homesite 1(3)XS	3(19)
Western Meadowlark *Sturnella neglecta*	b	30(85)GR 15(94)XS 9(30)Cult 1(5)Jun 1(3)BB	58(221)
Red-winged Blackbird *Agelaius phoenicus*	B	3(213)Cult 2(43)HD 1(8)Homesite 1(4)CB 1(3)XS 1(1)Gr	9(272)
Northern Oriole *Icterus galbula*	b	1(1)HD	1(1)
Brewer's Blackbird *Euphagus cyanocephalus*	b	3(327)XS 2(35)HD 1(200)Cult 1(15)G	7(577)
Brown-headed Cowbird *Molothrus ater*	B	1(3)BB	1(3)
Black-billed Magpie *Pica pica*	B	2(3)Jun 1(1)HD 1(1)BB	4(5)
Common Crow *Corvus brachyrhychos*	b	2(4)Gr 2(2)HD 1(44)XS	5(50)
Black-capped Chickadee *Parus atricapillus*	b	1(1)HD	1(1)
House Wren *Troglodytes aedon*	b	4(4)CB 2(4)HD 1(3)MS 1(1)XS	6(10)
Gray Catbird *Dumetella carolinensis*	b	2(2)HD 1(1)CB 1(1)XS 1(1)Jun	5(5)
Brown Thrasher *Toxostoma rufum*	b	6(7)HD 2(2)CB 1(1)XS 1(1)BB	10(11)

Robin *Turdus migratorius*	b	3(6)HD 2(3)CB 1(1)MS	6(10)
Mountain Bluebird$_x$ *Sialia currucoides*	b	2(3)Gr	2(3)
Bohemian Waxwing *Bombycilla garrulus*	t	1(2)HD	1(2)
Starling *Sturnus vulgaris*	b	1(6)HD	1(6)
Lazuli Bunting *Passerina amoena*	b	1(2)HD	1(2)
American Goldfinch *Carduelis flammea*	b	3(10)HD 1(3)MS 1(1)Gr 1(1)BB	6(15)
Rufous-sided Towhee *Junco nyemalis*	b	3(5)HD 2(3)BB	5(8)
Lark Bunting *Calamospiza melanocorys*	b	1(1)XS	1(1)
Savannah Sparrow *Passerculus sandwichensis*	b	2(2)Gr 1(5)HD 1(4)Cult 1(1)XS	5(12)
Grasshopper Sparrow *Ammodramus savannarum*	b	2(5)XS	2(5)
Vesper Sparrow *Pooecetes gramineus*	b	3(12)XS 3(4)Gr 1(1)Jun	7(17)
Lark Sparrow *Chondestes grammacus*	B	2(5)Gr 2(3)XS 1(10)Homesite 1(4)HD	6(22)
Chipping Sparrow *Spizella passerina*	b	3(5)BB 3(5)XS 3(4)Gr 2(4)HD	11(18)
Field Sparrow$_x$ *Spizella pussilla*	b	1(5)MS	1(5)

Legend:

1 - Based on Montana Bird Distribution.

2 - Numbers are total number of sightings
(total number of individuals sighted).

Res - Reservoir
CB - Creek Bottom
Gr - Grassland
MS - Mesic Shrub
XW - Sagebrush
BB - Badlands Bluffs
YR - Yellowstone River
HD - Hardwood Draw
GrCov - Grassland Coulee
Cult - Cultivated Cropland
Cr - Creek
Homesite - Homesite

Status:

x Montana "special interest or concern" species
- no evidence of occurrence
l probably valid records
t occurs, no evidence of breeding
b circumstantial evidence of breeding
B hard evidence of breeding

APPENDIX TABLE F

BIRDS IDENTIFIED ON THE PLEVNA STUDY AREA

Species	Status[1]	Sightings by Habitat[2]	Total Sightings
Canada Goose *Branta canadensis*	B	1(1)Cult	1(1)
Red-tailed Hawk *Buteo jamaicensis*	b	3(3)HD 3(3)CB	6(6)
Swainson's Hawk *Buteo swainsoni* x	b	1(1)Gr	1(1)
Golden Eagle *Aquila chrysaetos* x	t	1(1)Gr	1(1)
Marsh Hawk *Circus cyaneus*	B	5(7)Gr 3(4)Cult 1(1)XS	9(12)
Prairie Falcon *Falco mexicanus* x	B	1(1)Gr	1(1)
American Kestrel *Falco sparverius*	b	1(2)XS 1(1)Cult	2(3)
Sharp-tailed Grouse *Pedioecetes phasianellus*	B	6(32)Gr 4(23)Cult 2(14)XS 2(5)CB	14(74)
Sage Grouse *Centrocercus urophasianus*	B	1(2)XS 1(1)Gr	2(3)
Ring-necked Pheasant *Phasianus colchicus*	B	6(12)CB 1(2)Gr 1(1)HD 1(1)GrCou	9(16)
Turkey *Meleagris gallopavo*	b	1(27)Pine-Gr	1(27)
Killdeer *Charadrius vociferus*	b	2(2)CB 1(2)Gr 1(1)Cult	4(5)
Mourning Dove *Zenaidura macroura*	B	8(35)Gr 3(21)HD 2(12)Cult	13(68)
Common Flicker *Colaptes auratus*	B	1(1)CB	1(1)

Species	Status[1]	Sightings by Habitat[2]	Total Sightings
Eastern Kingbird *Tyrannus tyrannus*	b	2(3)HD	2(3)
Western Kingbird *Tyrannus verticalis*	B	2(2)Gr 2(2)Cult 1(3)HD	5(7)
Say's Phoebe *Sayornis saya*	B	1(1)Gr	1(1)
Horned Lark *Eremophila alpestris*	b	22(66)Gr 15(73)Cult 4(8)XS	41(147)
Rough-winged Swallow *Stelgidopteryx ruficollis*	b	1(1)Gr	1(1)
Barn Swallow *Hirundo rustica*	b	2(4)Gr 1(25)Homesite 1(2)Cult 1(2)HD	
Common Crow *Corvus brachyrhynchos*	b	1(1)GrCou	1(1)
House Wren *Troglodytes aedon*	B	1(1)HD 2(2)GrCou	3(3)
Brown Thrasher *Toxostoma rufum*	B	2(2)CB	2(2)
Robin *Turdus migratorius*	b	5(9)HD 2(2)Homesite 1(3)CB	8(14)
Starling *Sturnus vulgaris*	b	2(18)HD 2(2)Cult 1(1)Homesite	5(21)
Yellow Warbler *Dendroica coronata*	b	1(1)HD	1(1)
House Sparrow *Passer domesticus*	b	2(16)Homesite 1(4)Gr	3(20)
Western Meadowlark *Sturnella neglecta*	b	42(261)Gr 10(27)Cult 8(64)XS 1(12)CB	61(364)

Species	Status[1]	Sightings by Habitat[2]	Total Sightings
Red-winged Blackbird *Agelaius phoeniceus*	b	4(12)Gr 1(4)HD 1(3)CB	6(19)
Brewer's Blackbird *Euphagus cyanocephalus*	b	1(3)Homesite 1(1)Gr	2(4)
American Goldfinch *Carduelis tristis*	b	1(1)Gr	1(1)
Lark Bunting *Calamospiza melanocorys*	b	1(10)Cult 1(8)GrCou 1(6)Gr	3(24)
Savannah Sparrow *Passerculus sandwichensis*	b	2(2)GrCou	2(2)
Vesper Sparrow *Pooecetes gramineus*	b	11(28)Gr 7(29)Cult 1(8)GrCou	19(65)
Lark Sparrow *Chondestes grammacus*	B	6(13)Gr 1(1)Cult	7(14)
Chipping Sparrow *Spizella passerina*	t	1(2)Gr	1(2)
Field Sparrow *Spizella pusilla* x	b	3(8)Gr 1(1)HD	4(9)

x Montana "special interest or concern" species
2 Numbers are total number of sightings (total number of individuals sighted).

CB - Creek Bottom
Gr - Grassland
XS - Sagebrush
HD - Hardwood Draw
GrCou - Grassland Coulee
Cult - Cultivated Cropland
Homesite - Homesite
Pine - Pnderosa Pine

APPENDIX TABLE G

AMPHIBIANS AND REPTILES OBSERVED ON THE STUDY AREAS

Species	Sightings by Habitat	Total Sightings
Leopard Frog *Rana pipiens*	1(1)Gr $Cou_{a,d}$ 1(1)$CB_{c,d}$	2(2)
Painted Turtle *Chrysemys picta*	1(1) Res_a	1(1)
Common Garter Snake *Thamnophis sirtalis*	1(1) $Cult_a$	1(1)
Plains Garter Snake *Thamnophis radix*	1(1)Gr_a 1(1)CB_b	2(2)
Gopher Snake *Pituophis melanoleucus*	1(1)Res_a 1(1)XS_b 1(1)Gr_c	2(2)

Legend:

a - Sidney Study Area

b - Glendive Study Area

c - Plevna Study Area

d - Trap Data

Res - Reservoir
XS - Sagebrush
Gr - Grassland
CB - Creek Bottom
Cult - Cultivated Cropland
Gr Cou - Grassland Coulee

APPENDIX TABLE H

SPECIAL STATUS BIRDS FOR RICHLAND, GLENDIVE, AND FALLON COUNTIES

Goshawk$_x$ - Accipiter gentilis

Cooper's Hawk$_x$ - Accipiter cooperii

Swainson's Hawk$_x$ - Buteo swainsoni

Ferruginous Hawk$_x$ - Buteo regalis

Golden Eagle$_x$ - Aquila chrysaetos

Bald Eagle$_{x,\ y}$ - Haliaeetus leucocephalus

Osprey$_x$ - Pandion haliaetus

Prairie Falcon$_x$ - Falco mexicanus

Peregrine Falcon$_{x,y}$ - Falco peregrinus

Pigeon Hawk$_x$ - Falco columbarius

Whooping Crane$_{x,\ y}$ - Grus americana

Mountain Plover$_x$ - Charadrius montanus

Upland Sandpiper$_x$ - Bartramia longicauda

Long-billed Curlew$_x$ - Numenius americanus

Pygmy Owl$_x$ - Glaucidium gnoma

Burrowing Owl$_x$ - Athene cunicularis

Long-eared Owl$_x$ - Asio otus

Saw-whet Owl$_x$ - Aegolius acadicus

Eastern Bluebird$_x$ - Sialia sialis

Dickcissel$_x$ - Spiza americana

Olive-sided Flycatcher$_x$ - Nuttallornis borealis

Mountain Bluebird$_x$ - Sialia currucoides

Bobolink$_x$ - Dolichonyx oryzivorus

Clay-colored Sparrow$_x$ - Spizella pallida

Brewer's Sparrow$_x$ - *Spizella breweri*

Field Sparrow$_x$ - *Spizella pusilla*

x - Montana "special interest or concern" species
y - Federally endangered species

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